

The effect of three medic based pastures on take-all and root lesion nematode levels

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A grazing experiment was established at Roseworthy Campus to examine the use of sown oat cultivars resistant to cereal cyst nematode, *Heterodera avenae*, (CCN) and take-all *Gaeumannomyces graminis* as replacements for volunteer grasses in the cereal/livestock zone of southern Australia. Soil bioassays were conducted in 1991 to establish base disease levels and in 1992 to examine the change in levels of CCN and take-all under three pasture types: volunteer grass-medic (cv. Paraggio); grass-free medic; and oat (cv. Marloo)-grass-medic. The volunteer grasses were predominantly barley grass and ryegrass.

Methods

Soil samples were taken in June along four strata in each paddock to a depth of 20 cm and placed in 22 cm pots in the glasshouse. Seven wheat (cv. Condor) plants were sown and allowed to grow to tillering before being destructively sampled for root examination. Scoring of roots for CCN damage and the percentage of seminal roots with lesions was recorded with suspected root lesions cultured onto agar plates for identification. Due to visible damage of the root cortex in several plants, the root samples were placed on a water mister to estimate the number of root lesion nematodes (RLN) that were present.

Results and discussion

In 1991 base levels of CCN and take-all were low. In 1992 the level of CCN was still low, however the percentage of seminal roots infected with take-all increased significantly under the volunteer grass-medic pasture type, relative to the grass free-medic and oat-grass-medic pasture (Fig. 1). The difference in levels of take-all was directly related to the percentage of grass in the botanical composition of the three pastures. The use of Marloo oats significantly reduced the amount of grass in the pasture and hence the level of take-all inoculum. *Pratylenchus neglectus* (RLN) numbers per plant were significantly higher under the oat-grass-medic pasture type (Fig. 2). The number per g root weight was not significantly different due to the variability in RLN numbers and root weight. This data suggests *Pratylenchus neglectus* numbers may increase under Marloo oats; however the assumption is made that the initial RLN population was even across the trial site in 1990. There was no correlation between RLN numbers and the incidence of take-all infection. Further research using small micro plots to reduce field variability is required to confirm these results.

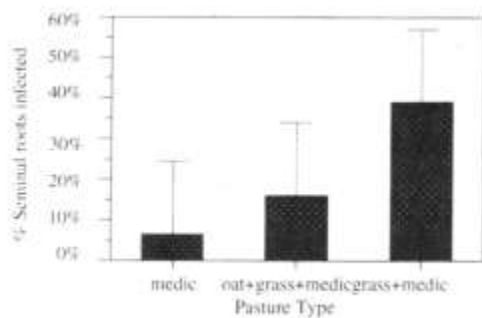


Figure 1. Percentage of Condor roots infected with take-all under three pasture types.

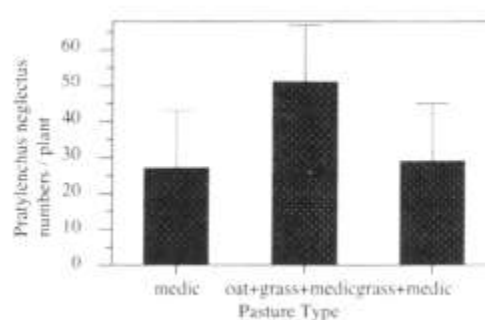


Figure- 2. *Pratylenchus neglectus* numbers/plant under three pasture types.

